THE ATOM

Los Alamos Scientific Laboratory — May, 1964

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Editor: David Sundberg
Photography: Bill Regan and Bill Jack Rodgers
Contributors: Members of the PUB staff

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ON THE COVER: The Laboratory's proposed new "Meson Factory" inspired the cover for this month's magazine. The subject for Bill Regan's photographic interpretation is a portion of the model of the physics facility.

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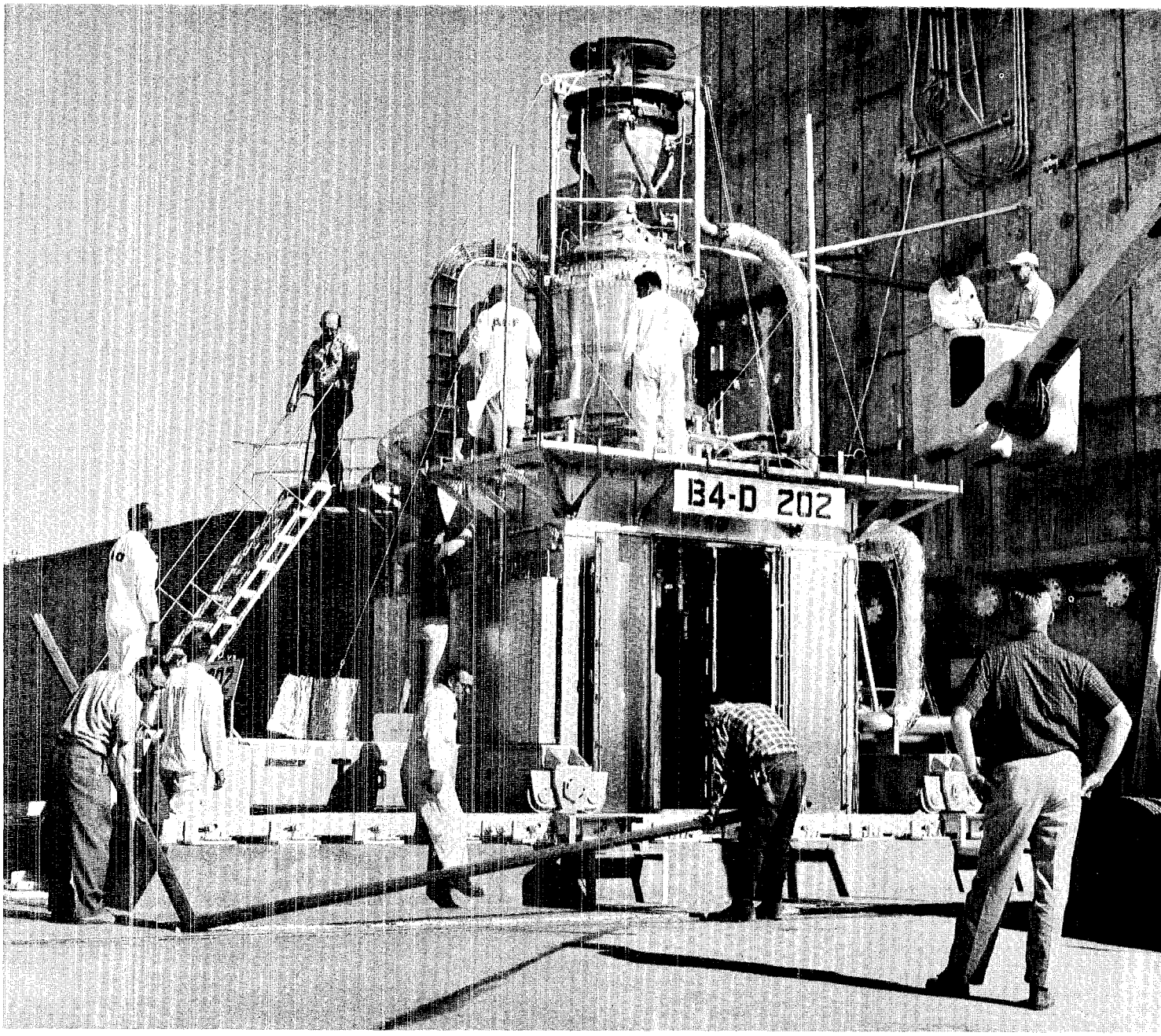


HOT RUN SET FOR KIWI B-4D

LASL's Kiwi B-4D reactor is shown at Test Cell "C" at the Nuclear Rocket Development Station in Nevada where it is being readied for a "hot run" later this month. It will be the first such hot test of a Project Rover experimental reactor since Kiwi B-4A was tested November 30, 1962. Since that time, the Laboratory and the NERVA contractors have performed a series of cold flow experiments with Kiwi reactors to evaluate a redesigned reactor core support structure and hot-end seal which have been incorporated in the new model.

Short

The time for Dr. J. Robert Oppenheimer's May 18 talk at the Los Alamos Civic Auditorium has been changed from 8:30 p.m. to 8 p.m. The former Laboratory director will discuss "Niels Bohr and Atomic Weapons." The public is invited and there will be no charge for admission.

Mrs. Helen May McGillivray, 50, an accountant in AO-3 and LASL employe since 1949, died April 6 in an Albuquerque hospital after a brief illness. Mrs. McGillivray is survived by her husband, Argyle, an employe in GMX-3, and three children. Burial was in Memorial Gardens in Santa Fe.

Manuel Rendon, S Site laundry employe, retired April 24 after clocking about 175,000 miles getting to and from work. Rendon, 62, commuted from Dixon, N. M., from the time he joined the Laboratory in 1948 until 1956, when he moved to the Hill. Last October he moved back "home" to his small farm at Dixon and began commuting again. With that much traveling behind him, Dixon told his LASL friends he plans to "stay at home and take it easy, and maybe do a little fishing."

New Mexico's pretty ambassadors to the World's Fair in New York City are prepared to tell visitors about Los Alamos. The six young ladies who are guides at the Land of Enchantment exhibit at the Fair spent a busy day in March touring community and Laboratory sites. Any questions they can't answer they will refer to the Los Alamos Chamber of Commerce or the LASL Public Relations Office.

Some 9,000 handbooks for prospective occupants of fallout shelters were handed out in April to all families registered with the Los Alamos Civil Defense organization for shelter assignments. The handbook was compiled and distributed under the direction of the Shelter Managers organization, headed by the Troika: Wright Langham, Bob Drake, and Frank Tallmadge. According to CD Director Bob Porton, the handbook is the only one of its kind in the country.

Darol K. Froman, who retired in January 1962 as Technical Associate Director of the Laboratory, has been named to the General Advisory Committee of the Atomic Energy Commission. President Johnson made the appointment to the nine-member committee, which makes technical and scientific studies for the AEC. Froman joined LASL in April 1943, coming from the Metallurgical Laboratory at the University of Chicago, and is a world-recognized authority on nuclear weapons. During his Laboratory years he was head of several groups and divisions and headed the scientific staff at the Eniwetok tests in 1948; he became Technical Associate Director in 1956.

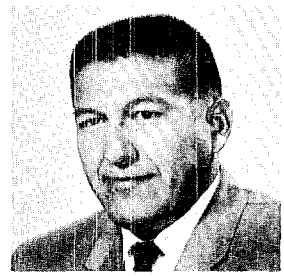
The course on "cryogenics for nuclear rocket applications" that was presented for Nuclear Rocket Development Station personnel in Nevada in March will be repeated May 18-21, according to Frederick J. Edeskuty of CMF-9. The second presentation has been expanded to four days and will be at the Sahara Hotel in Las Vegas. Among those assisting Edeskuty in the instruction and seminars will be seven LASL staff members.

A patent on an invention by L. J. Mullins, Jr., J. A. Leary, C. W. Bjorklund, and W. J. Maraman, all of CMB-11, is one of 36 government-owned patents which the AEC has recently made available for public use. The LASL staff members invented electrorefining cells for obtaining plutonium metal that is at least 99.98 per cent pure. The patent was issued July 16, 1963.

Subjects

"Art and the Atom," a brochure produced by the Western Lithograph company of Wichita, Kansas, for the Taos Art Association, won the blue ribbon award of merit for brochures in the Southwestern Graphic Arts association's 25th annual printing exhibit at Nashville, Tennessee, in April. The brochure is made up of original paintings, by Taos artists, used by LASL in its recruiting advertising. The paintings are now in a travelling art exhibit being shown in major cities around the country, for which the "Art and the Atom" brochure is serving as a catalogue.

A $7 million boost to Los Alamos computer facilities is included in the 1965 budget request of the Atomic Energy Commission. The new equipment would be installed in the Administration-Stretch Building addition that already has been approved.



James S. Hena, D-8 lithograph operator and Governor of Tesuque Pueblo, has been named one of two winners of the Jaycee's Outstanding Young Men of New Mexico Award. Hena, who was nominated by the Los Alamos chapter of the Jaycees, received the award at a special banquet in Clovis, April 25. Each year the honor goes to one or two New Mexico men between the ages of 21 and 35 for "outstanding achievement or contributions of considerable importance in their chosen fields, organizations or communities." In nominating him, the local Jaycees stressed Hena's record as a leader in his pueblo. He is one of the youngest men ever to be appointed a pueblo governor.

Sixty-seven faculty members and graduate students representing the Associated Rocky Mountain Universities toured technical areas at LASL April 23. The visitors came to the Hill from Albuquerque where they were attending a four-day meeting on radiation effects on materials. LASL Director Norris Bradbury took part in a panel discussion at the meeting April 24 on the subject, "University-AEC Cooperation."

Local Jaycees and Art Houle Chevrolet, Inc., have announced plans to co-sponsor the Soap Box Derby in Los Alamos, July 18. Boys from Los Alamos and Rio Arriba counties are eligible to compete if they are at least 11 years old but not yet 16 on August 1, 1964. The first place winner in the race between gravity-powered, home-made cars will win a $500 U.S. savings bond, a trophy, and an expense-paid trip for two to Akron, Ohio, for the national races on August 15. Rules and information on entering or sponsoring a car are available from Art Houle Chevrolet or Jaycee members John Allen and Ed Maxwell. Maxwell said several LASL groups have already made plans to sponsor cars.

A comprehensive index to the LASL News has just been published by the Laboratory's Public Relations Office. It contains references to all stories included in the LASL News from the publication's inception in November, 1958, until it was discontinued December, 1963. Copies of the index are available upon request from the PUB office in the Administration Building, phone 7-4506.

Members of the ad hoc committee viewed a scale model of "meson factory" during their last meeting here in March. From left are Drs. George Kolstad, AEC Division of Research, who was chairman; Richard Taschek, LASL P Division Leader; Wesley Brittin, chairman of the University of Colorado's Physics Department, and Lieut. Col. David Overton of the AEC's Division of Military Application.

Right: Professor Harry Fechter eyes lineup of drift tubes in cutaway model of LAMP facility. Fechter, a member of ad hoc committee that recommended construction of the accelerator, is professor of physics at Idaho State University in Pocatello.

PROPOSED NEW LASL MESON FACTORY GETS DOUBLE STIMULUS

The Laboratory's meson physics facility proposal received a double stimulus last month:

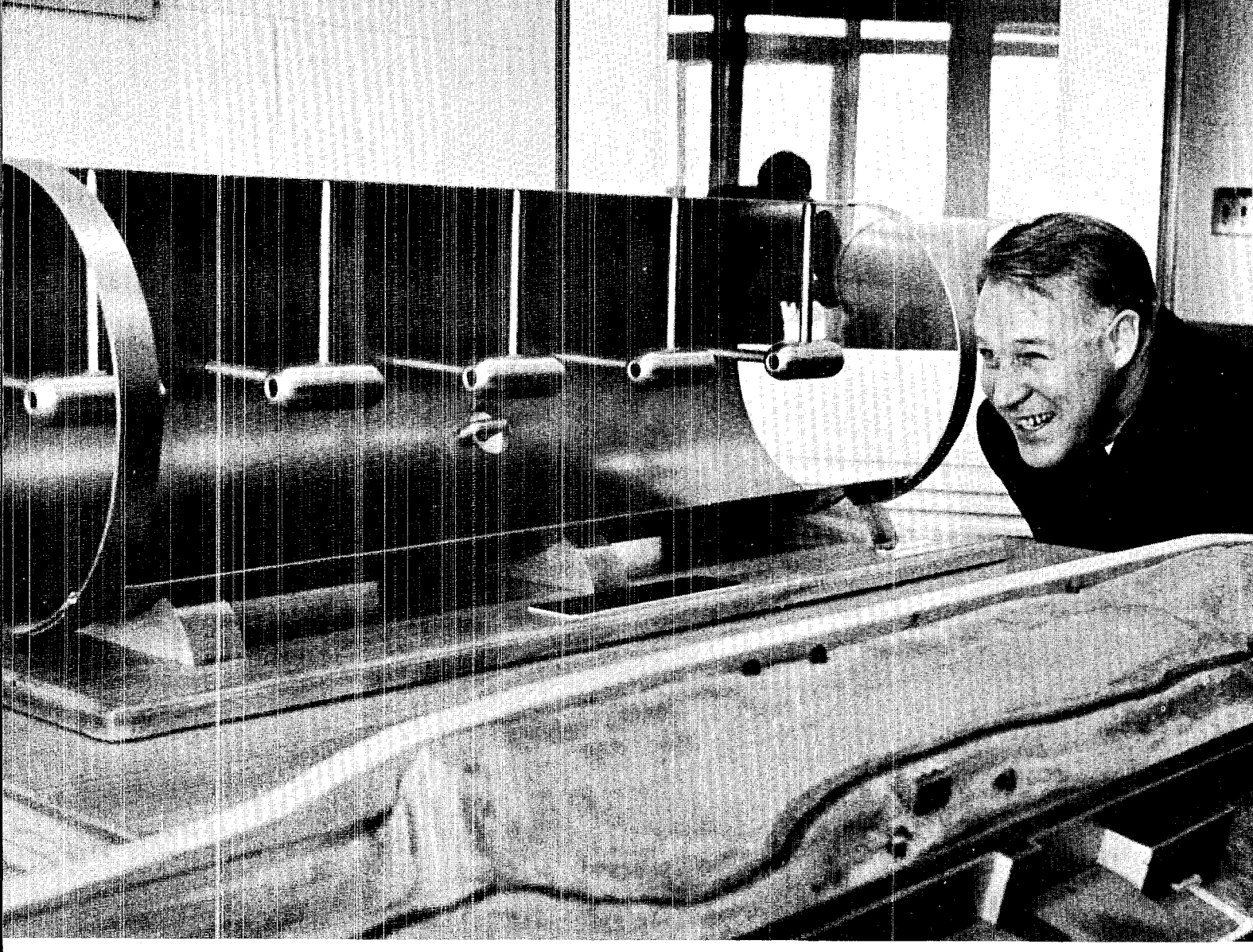
—Construction "at the earliest possible date" was recommended by a special AEC-sponsored committee.

—A $500,000 "advance" for additional engineering and design was made by the AEC.

LASL Director Norris Bradbury noted the so-called "meson factory" still has a long way to go before it's a reality, but termed the developments "very gratifying and an indication of the great interest in the project."

The committee was named after a meeting in Los Alamos last December attended by representatives of the AEC and 22 Rocky Mountain area universities and colleges. Chairman of the ad hoc group was Dr. George Kolstad of the AEC's Division of Research.

In its report to the AEC the committee also pressed for continued collaboration between the Labora-



tory and academic institutions. The committee noted that the meson facility would be "national" in character, with use shared by researchers from the entire nation.

Citing the dearth of advanced research facilities in the Rocky Mountain West, the study group referred to the project as vital to the continued scientific, educational and economic growth of the area.

The project--named LAMP, for Los Alamos Meson Physics facility--concerns construction of a linear accelerator some 2100 feet long. Estimated cost is $50,000,000. It would take about six years to build the machine and its support units. Present planning locates the facility on a small mesa northeast of the Royal Crest Trailer Court, between Los Alamos Canyon and the South Mesa Access Road.

Mesons are thought to be the "glue" that holds the nucleus together. They will be produced by bombardment of a nucleii by a high-current beam of protons.

The half million dollars obtained for planning reflects a relatively new AEC policy that authorizes fairly detailed planning for facilities even though they have not been finally approved, theory being that once approval is granted there will be economies in time and money in getting construction underway.

The latest boosts for LAMP followed reports of two committees of the President's Scientific Advisory Committee, the Ramsey and Bethe Panels, which support the type of facilitity the Laboratory proposes. LASL staff members--James Young, James Griffin and Charles Critchfield of the Theoretical Division and Louis Rosen and Darragh Nagle of Physics Division--made presentations to both panels.

A new group was organized within Physics Division a year ago to lead the detailed planning for the LAMP facility. Designated P-11, it is headed by Darragh Nagle.

THE POLITICS OF SCIENCE

. . . an interview with Senator Clinton P. Anderson

The Senator is a busy man and even during the Presidential visit he broke away for several moment's phone conversation with his office.

Under the title "The Politics of Science," the April issue of *International Science and Technology* presented the transcript of an interview with New Mexico Senator Clinton P. Anderson. Because of the numerous references to Los Alamos Scientific Laboratory, *The Atom* obtained permission from the editors to reprint a portion of the interview.

After conversation concerning various non-LASL Atomic Energy Commission projects, the subject of the Senator's reliance upon his technical advisors arose. Senator Anderson likened the scientists who appear before his committees to "precinct chairmen."

He said, "By the time you've been elected to office a few times, you learn that not every precinct chairman can be trusted, and you find out very quickly which precinct chairman delivers for you and which precinct chairman doesn't." The interview continued:

What is it about these precinct captains of science that tips you off?

Oh, I don't say you're tipped off. You have three precinct workers and one fails you. And you say to yourself, "Why was I misled by that fellow?" You never know, but you never trust anybody who looks just like he looks. And that's the way with these scientists. We're never real sure.

I remember the first time I talked to Ernest Lawrence. I didn't know much about him, and I wasn't disposed to spend much time with him because I was trying to talk to some other people, too, and he finally said. "You're from South Dakota, aren't you?" and I said, "Originally," and he said, "So am

Senator Anderson was the man chiefly responsible for the December 7, 1962, visit of President Kennedy to Project Rover facilities at Los Alamos. Shown here are (from left) AEC Chairman Glenn Seaborg, the President, LASL Director Norris E. Bradbury and Senator Anderson.

I." We just adjourned everything and talked about all the people we knew who were from South Dakota. And I found he had other interests in life besides his scientific interests. He had a family in which he was interested; he had friends in whom he was interested, and they had families and so forth. I decided that he was a better sort of person than I thought he was the first time I saw him. And anything he asked me for from that time on, I tried to do.

You depend on your faith in people and on their capability to do a job.

I do think we pick individuals by use of a queer yardstick. We pick the ones we trust. If Norris Bradbury came to me and said "I've found a new way to make a bomb. I'm going to take three scoopsful of common dirt, an ounce of paregoric and an ounce of something else, and shake them up," I would know it would work. Norris has a sure instinct. He can't tell you why sometimes, but I trust him even if I don't know the scientific reason for what he's doing, or couldn't understand the scientific reason if I knew it.

In modern government and big science, you and the Congress become part of the whole process. I think of the nuclear rocket program. You're an espouser of the rocket, and I've had the feeling that the technical people were a little faint of heart about it.

I would hate to see in nuclear rocket propulsion the sad experience we had with the nuclear airplane. We never got started with the nuclear airplane in a way that meant we intended to finish it. We had a competitor, the airplane industry. And many people worried that the airplane industry would suffer if a nuclear airplane were constructed. I don't think that was a sensible viewpoint at all, because the nuclear airplane had such limited uses. It was a patrol vehicle. It was a policeman who could get out and walk the beat and could walk it a long, long time. And that's all we saw in it. But we spent over a billion dollars on it and then, when it looked as if it might work, it was abandoned. And now there is talk that it may be the most interesting development we could come to, and that maybe we ought to revive it. Before long you'll see the military asking for it, because it can patrol. I hope this wouldn't happen with Rover. The devices we are going to send to the moon will need enormous propulsion power.

What does the nuclear engineer tell you about the feasibility of nuclear rockets?

When I talk to some of the people who have responsibility in that field they take the position that the project will never work, that we'll never get a propulsion device that will be useful, that it can never be the third stage of something or other we hope to build, and therefore that we might as well take it very slowly in the laboratory. Well, we had a hard time with many of our devices by letting them go too long. At the time the first proposal was made for the hydrogen bomb, they would have built it very quickly if they had really gone ahead with the engineering they had at hand and the inventive devices they had in mind. But we postponed it. And it was hard to go back, pick up the pieces and start over again.

I wonder how you feel when you go down to Los Alamos for a visit. Is there any part of you that itches

continued on next page

The Scientists Will Educate You

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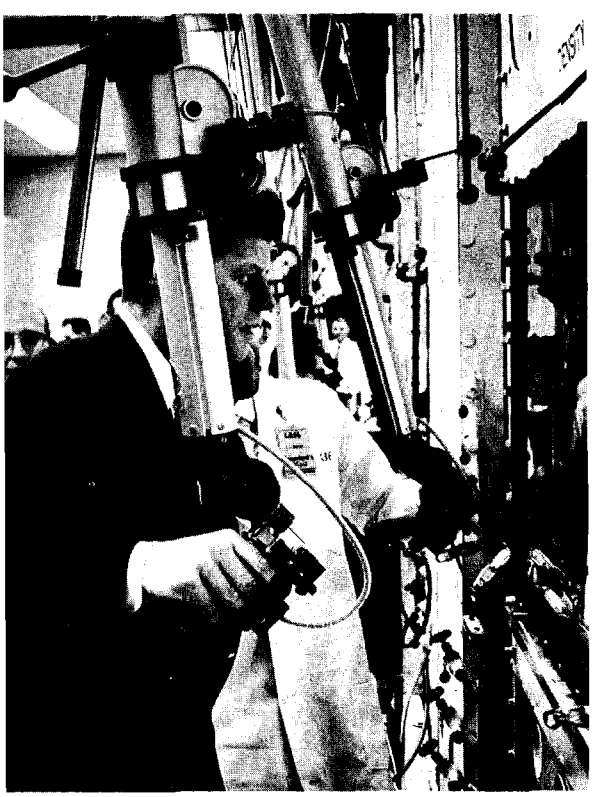
to put your hand on the valves? Is there a frustrated scientist inside you?

No, there's not. Not in the slightest. When we had President Kennedy down there, he saw a little device—you put your hand in the mittens and control something out ahead. You couldn't get him out of there until he'd tried it. But I've been in there about a dozen times and never wanted to try it.

What was it, Senator, that attracted you to atomic energy and space activities?



Unlike the late President John F. Kennedy, Senator Anderson finds no frustrated scientist within himself when visiting Los Alamos.

Well, it was in my state. You know, a little state gets tired, eventually, of hearing how wonderful it is in New York, Massachusetts, Illinois, or California. You think there are things out in your country that are worthwhile, and I became very proud of the people in the Los Alamos Laboratory and the things they were trying to do. I made up my mind that as soon as I could, I wanted to get better acquainted with them. Afterwards, I went to Vice President Barkley and told him I'd do anything I could to get on the Atomic Energy Committee and work. I was appointed, and right after that they had the first test in the Nevada area and so I went out. I was the only member of the committee who went. I took a short briefing and saw one of the bombs assembled. And I thought it was sort of a nervous business. They got us into a room, picked up these pieces of high explosives and put them into place, and the man said very casually, "You know what would happen, of course, if we dropped one of those." I wondered what would happen if the suction device got clogged somewhere and this thing was dropped. But I saw the whole bomb finally put together, and then we went out and watched the bomb explode. It gave me a little different feeling.

Can you tell us a little about your own educational process? One gets the feeling from reading the hearings that you people are very knowledgeable about the program these days.

Well, you have witnesses to help you. One day it's somebody from Oak Ridge, and one day it's somebody from Los Alamos and one day its somebody from some other spot. They've been working very hard for a long time and getting nowhere. And in desperation they come down and sit in this office and start telling me what their problem is. In a way, I couldn't care less because I don't know a thing about their idea and what they want. So they explain it to me. By the time you get through, you ask yourself, "Is it necessary or would something else serve the same purpose?" So you make some inquiries and you read some books and magazine articles. It's quite different from going to school. But the scientists will educate you if you give them a chance.

What about the role of the legislative branch in establishing goals in science?

Well, I don't know whether we do much in that way.

You certainly push certain things. Well, let's take saline water. We had a panel. I wanted to find out what the importance of atomic energy might be and how long it was going to take to get where it might be competitive with other types of fuels. We had study teams of all kinds, and one day I began to wonder if this problem of saline water might not be solved by atomic energy. The reason was that I was on two committees. If I were only on one, I wouldn't have encountered these things. But one day somebody said that to get salts out of the sea water the water had to be lifted to about 1400°. I went from that meeting to another in which they were talking about a certain type of reactor. They said when you run water through there you use water as a coolant, it rises to about 1400°. And I said, "Why not consolidate these two things?" So I wrote to Los Alamos to see what they could suggest. Sure enough,

If You Give Them A Chance

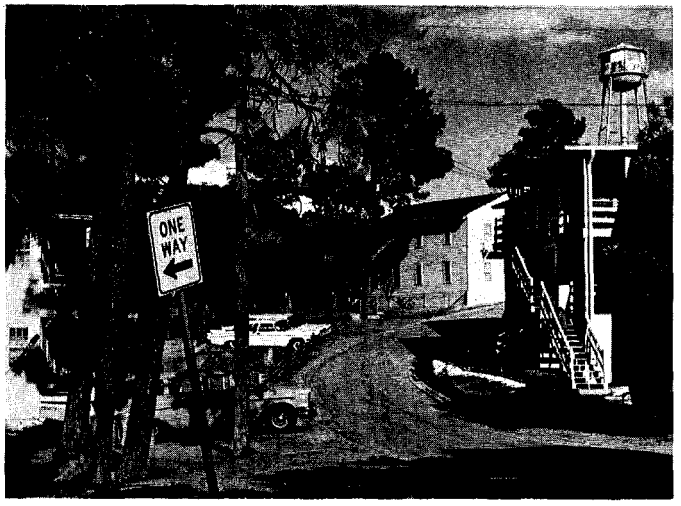
Dr. Philip Hammond had made a study that showed for about $600 million he would build a plant that would satisfy Los Angeles and its water requirements and give them a boundless, endless, eternal supply of water from the Pacific which they couldn't get by any other device, and give them electricity as a by-product at a cost below anything they now have.

Well, that answered the scientific question, except who would turn a card for $600 million? It's like going into a gambling game. You don't mind taking a hand of blackjack at 50¢ or a dollar, but if it's $50,000, you leave that for Nick the Greek. So I had to write to Phil Hammond and tell him that this was a fine gamble, but I just didn't know anybody who'd be fool enough to gamble $600 million. I asked him: "How big should the pilot plant be?" His reply was, "A pilot plant would teach you nothing. You have to build it big."

Well, Hammond kept on working on it, because I needed help and he was kind enough to keep giving it to me. And then, sure enough, the Atomic Energy Commission got more interested and the Secretary of the Interior, Mr. Udall, got interested. And now Hammond is working at Oak Ridge in the cooperative effort between AEC and the Department of Interior, trying to project what a plant can do. The plant he's proposing will develop enough electricity for the greater metropolitan area at a cost of 2 to 2½ mills per kilowatt hour, which is lower than Bonneville, lower than what they're going to be charging in the Great Northwest in a short time. The present figure on saline water is about a dollar per thousand gallons, give or take a few pennies. We hope to get it down to 40¢ or 50¢. At 20¢ it's a godsend, but Hammond expects to get it even lower than that figure. You can water all the area around Los Angeles with that endless supply from the Pacific Ocean. And that's why I've been interested in saline water. We can take it to parts of the earth where we're not making any impression with our foreign aid programs. We can do great things with it.

Meeting of two nuclear experts, Admiral Hyman Rickover (right) and Dr. Bradbury, was arranged by Senator Anderson, shown here at Los Alamos Airstrip with Paul Wilson, former AEC area manager for Los Alamos.

AFTER MANY FALSE STARTS, THE SUNDTS ARE HEADED FOR OBLIVION



Narrow winding streets, tiny lawns, are typical of the Sundt area of Los Alamos. Twenty years ago the apartment buildings were considered beautiful by comparison to the town's other available housing.

A couple of young Sundt residents play with a ball tied to a street sign. Long on children, the Sundts are short on playgrounds.

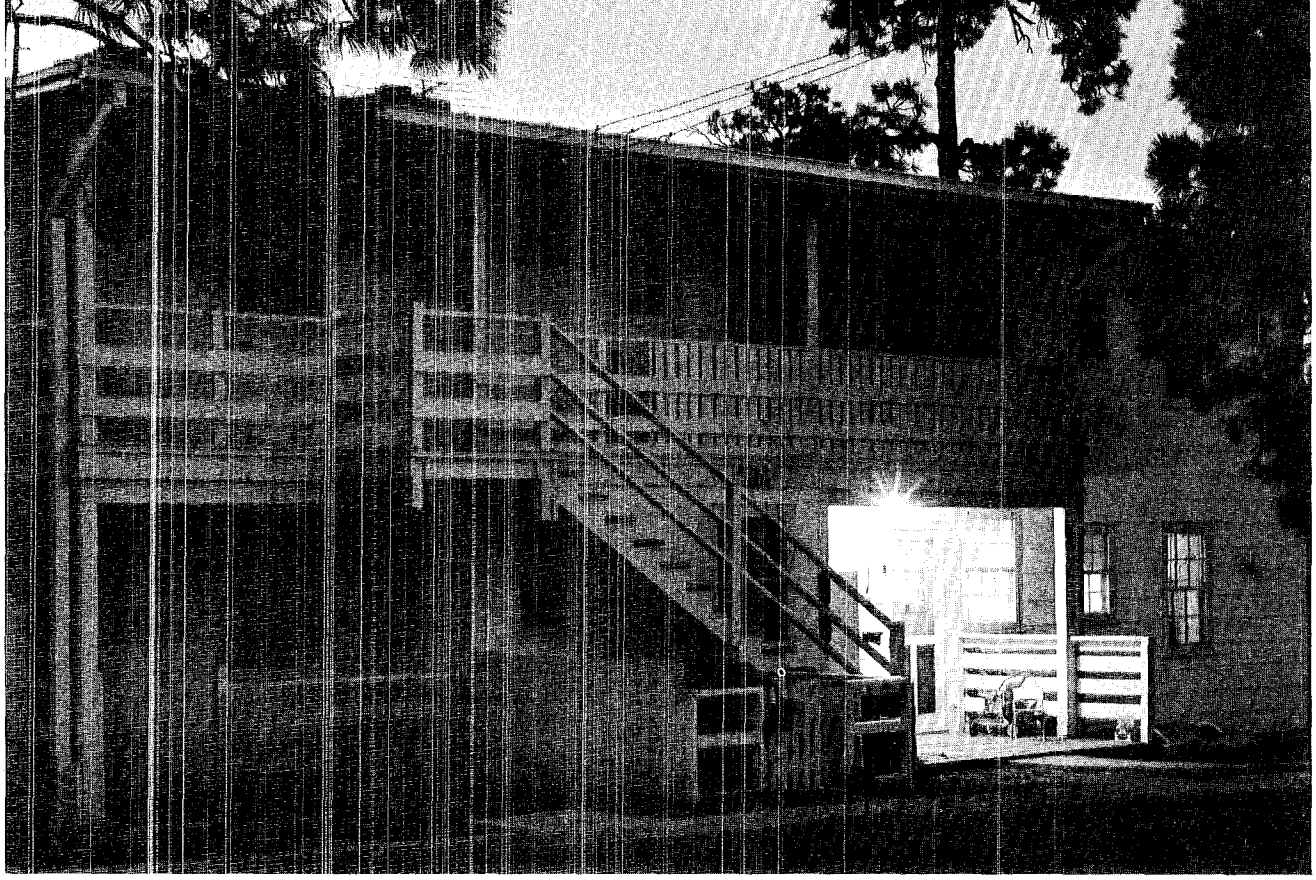
Shed a tear for the Sundt apartments. After many false starts, they are now firmly headed down the road to the scrap heap.

When the apartments were completed in November, 1943, at a cost of more than $2 million, an optimistic Army official announced that all foreseeable housing requirements at Los Alamos had been fulfilled. He was only off by a factor of 10. The Army also had estimated the Sundts would last five years—a miss by a factor of four plus.

On February 24, 20 years and four months after their completion, the Sundt apartments came off all housing assignment lists of all employers, the beginning of a move that will lead one day to their demolition. For nearly a year past, Sundt assignments had been made only on a tentative basis; i. e., on the written understanding that the tenant would move out when asked to do so.

Now, no more Sundt assignments are being made at all. Although no firm date for vacating the buildings has been set, as fast as each building becomes vacant by attrition it will be boarded up or torn down. When a group or area of buildings is vacant, all will be torn down to make room for new housing or community facilities, such as a site for a new Central school. This is a long-term process, but it is regarded as inevitable in the program of transfer of ownership of the community.

Originally, there were 74 buildings containing 332 apartments in one, two and three bedroom sizes. They were erected under two separate contracts, the ones with wooden siding by the Sundt Construction Company, and the ones with asbestos siding by the McKee Company, builder of many other structures at Los Alamos. The McKee units originally were covered with green plaster board, the asbestos siding being added in 1947 to cover up all the holes and scars. In common usage, both types have since been referred to as Sundt apartments.



Already marked for the scrap heap, this Sundt apartment house awaits the exodus of its last occupants.

Both types were heated for the first several years by coal and wood, hand-fired by a corps of janitors. Many near-legends arose from the antics of the fire tenders and the vagaries of the heating system. Smoke instead of hot air sometimes issued from the vents along with the singing of the janitors and their shouting over a dice game. Sometimes the fires went out entirely, usually on the eve of a festival when all hands were off the Hill.

The advent of natural gas late in 1947 did away with these quaint customs, as it also did away with the Black Beauties, the fiendish, smelly, oil-burning cooking ranges which seemingly had minds of their own—especially when company was due for dinner. Illicit electric broilers and hot plates had fairly well replaced the oil ranges by gas arrival time, but their memory lingered on for years. The appliances were illicit on two counts: first, because the town's electrical system could not stand the load; second, because most of them were liberated by moonlight requisition from vacant Hanford and McKee prefabs in the eastern area, where they were standard equipment.

Fire escapes were added in 1948; new fences and paint jobs came along 10 years later.

Rigidly rectangular, topped by tall chimneys to make the furnaces draw, lacking almost entirely in the external amenities, the Sundt apartments nevertheless were the prime housing at Los Alamos for several years, and were occupied by some pretty famous people.

However ugly, they were things of beauty to the 1943 occupants of the "winterized" shacks, the Pacific and Quonset huts, and other prefabricated monstrosities serving as family housing in those hectic days.

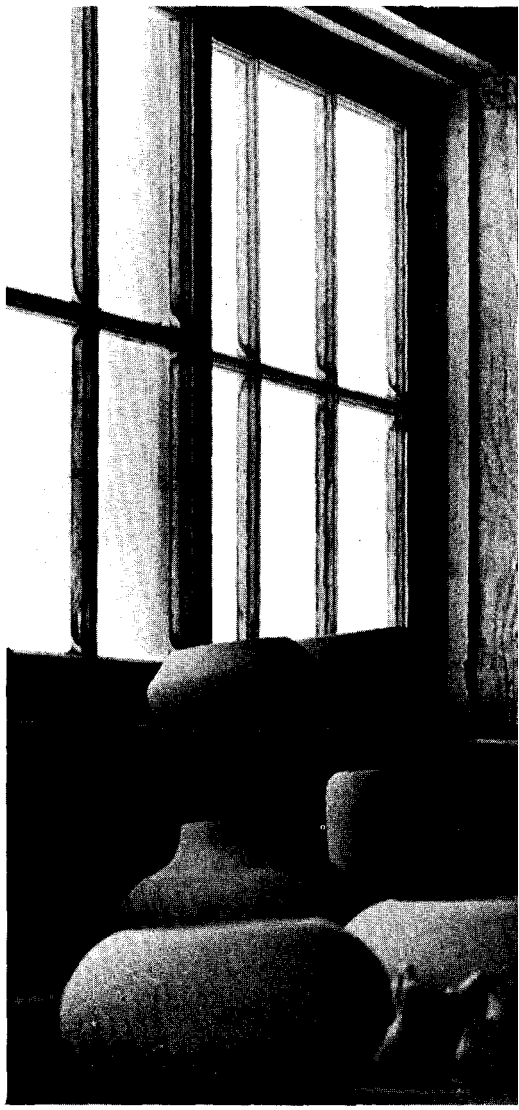
The Sundts had (and have) central heating, good hardwood floors, showers, fireplaces in many of the units, and lots of room compared to anything else available at the time. But as newer and more modern apartments, duplexes and single-family dwellings appeared over the years, the Sundts gradually settled to the bottom of the waiting lists. There were 40-some vacant when the decision was made to stop assigning them on February 24. Rising maintenance costs were among the factors that led to the decision to do away with them.

There is no accurate way to add up all the costs of renovating and rebuilding which have been applied to the Sundts. Original construction costs varied with the type. The 1-bedroom duplexes (2 family), cost about $13,000 each. The 8-family, 1-bedroom apartment houses cost about $40,000 each. The 4-family, 2-bedroom apartments cost $28,000 per building, and the 4-family, 3-bedroom apartment buildings cost $30,000 each.

All the original Sundts and McKees are still standing except for one building of 3-bedroom apartments which was sawed in two and another whole building which was torn down, both to make room for the Central Avenue extension.

Maria
Potter . . . Teacher

The grand old lady of San Ildefonso has handed down her skills to one generation. Now she's teaching two more.



One day last month a bright-eyed four-year-old with long black pigtails struggled to shape a glob of wet clay into something beautiful. Like the Indian children of hundreds of generations before her, Joanne Martinez of San Ildefonso was making her first awkward efforts to learn the ancient craft of pottery making.

Beside her, watching and teaching, was her great grandmother who, as a child not much older than Joanne, had taken those same first steps some 70 years before, clumsily shaping a crude bowl for her play house. She was Maria Montoya Martinez, now more than 80 years old, whose mastery of the craft has brought international fame and fortune to herself and to her pueblo.

Maria has already handed down her skills to one generation and is teaching two more. Her daughter-in-law, Santana Martinez, began learning the craft thirty years ago and today her signature on a piece of San Ildefonso black-on-black is nearly as coveted as Maria's own. Santana's daughter, Anita Pino, is learning. So is Anita's daughter, Evelyn, and little Joanne. Someday these children, in turn, will teach other generations as Pueblo potters have done for 700 years.

It was Maria's aunt, Nicolasia Pena, who taught Maria and her sister Desideria, (now a well-known potter in her own right) the techniques of pottery making. She explained how to pat out a flat "tortilla" of clay for the bottom of the bowl, then roll more clay into thick "sausages" to coil around the base to form the walls. She taught them how to smooth and flatten the sides and carefully scrape away the excess clay. Later on, when they had learned to make bowls worth firing, she explained about adding enough sand to their clay to spread out the clay particles to make them heat evenly. She showed them how to polish with a stone. Then she showed them how to arrange their bowls upside down on a layer of rocks and cover them with a mound of dried dung, and how to burn it just right—not too hot, not too smokey. The techniques were crude and simple, the same techniques used for centuries before, the same in use today.

It was a fragment of ancient pottery uncovered in the ruins of

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In a reflective moment, Maria, the famed potter of San Ildefonso, gazes over some of the products of her art.

Below: At left, Maria teaches her great-granddaughter, Joanne Martinez, one of the first steps in making pottery. A flat "tortilla" of clay is molded to form the base of a bowl. *In the center and right photographs,* Maria, having formed the walls of the bowl with thick coils of clay, shapes and thins them with her skilled hands. Not quite up to this task, Joanne works on her own creation.

A dried bowl gets a red "slip," a watery mixture of red clay applied over the outside with a bit of rag. Then the polishing begins. Here, Maria's daughter-in-law Santana, whose bowls also are noted for their magnificent sheen and metallic black finish, begins the long tedious process. An ordinary stone, rubbed smooth with use, is the only tool. "This is the hardest part," says Santana. "You have to keep rubbing and rubbing until it's right."

Maria admires her daughter's work in progress. The Martinez potters get one kind of clay from the Pojoaque area, another from closer to the Pueblo, mix the two half and half. Red clay used for the slip comes from La Bajada.

THE BOWL IS SHAPED, THEN IT GETS A RED "SLIP," A POLISHING, AND FINALLY IT IS "FIRED."

Once the sheen has reached perfection, the design is applied with a watery clay mixture. Santana does her own painting, sometimes assisted by her husband Adam. Marvels Santana's son, Eddie, who works with LASL's Mail and Records, "She never has to measure. She always knows how to make the design come out even." Later, on a warm, still morning, the bowl will be fired under a heap of dung at a temperature that's just right (scientists measure it at 725°C). The fire, smothered at precisely the right moment with an application of powdered dung, will produce another perfect bowl of San Ildefonso black-on-black.

Maria . . .

continued from page 12

Frijoles canyon and the constant encouragement of a group of archeologists, headed by Dr. Edgar L. Hewett that launched a career for Maria and an industry for the Pueblo.

In 1908, Maria's husband of four years, Julian Martinez, was hired to help with the excavation at what is now Bandelier National Monument and Maria joined him there. One day, to settle some argument about a pot sherd, the archeologists asked Maria to reproduce the pot for them. Maria didn't get around to the job until late the following winter, but while she was at it, she made several pots. Julian spent his winter evenings painting the designs with the whittled-down point of a yucca leaf.

The archeologists were so delighted with the bowls they hired Julian and Maria to work at the Museum of New Mexico in Santa Fe. Before long they were keeping not only the museum but Santa Fe merchants supplied with pottery. And that was the beginning.

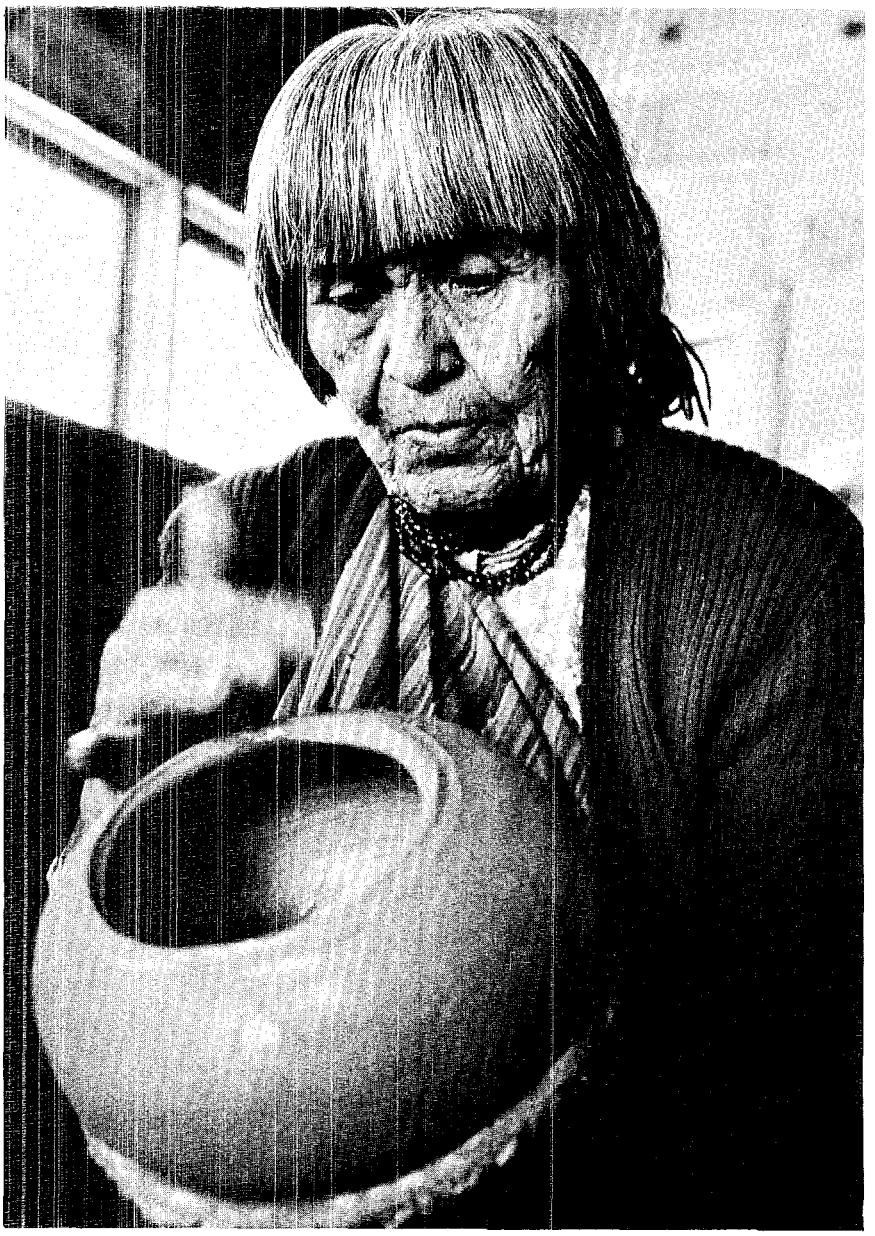
It was not until about 1912 that Maria's first black pottery came into being, and even then it was quite by accident.

During the firing of the first batch of bowls, back in 1908, something had gone wrong with the fire and two of the pots were badly blackened. The ruined bowls were put away in a storeroom and forgotten. Several years later, in a desperate effort to keep up with the demand, Maria added the old black pots to her supply of polychrome ones for a merchant. From then on, they couldn't make black pottery fast enough.

At first the bowls had a matte black finish with a shiny design but about 1920 Maria and Julian changed to the shiny background with a dull black design that remains today.

For years Maria and Julian kept their process a secret, but times were hard in the Pueblo. The population dropped from about 150 people to only 80 and everyone was poor. Everyone but Maria and Julian. It was then they decided that their craft, like the keeping of ditches, building homes and the other projects of the pueblo, were meant to be shared. They began teaching the process to other women. New shops opened and before long pottery was a major industry, breathing new life into the pueblo.

Today pottery making is dying out again in the Pueblo. "Lots of women used to make it," Santana said the other day. "But ever since Los Alamos began—well, they just like to go up there instead." Perhaps Maria's talents and teaching will inspire coming generations of the Martinez family to carry on the centuries old tradition a little longer.



The pottery wheel has no place in the pueblo. Here, Maria's fast-moving hands form a bowl into its desired shape.

SURPLUS EQUIPMENT BENEFITS ROVER

A half million dollars worth of surplus cryogenic equipment returned from U.S. missile bases in England has been adapted for use in the modification and expansion of Test Cell "C" at NRDS.

The expansion program, getting ready for Phoebus, LASL's follow-on to the Kiwi reactor series in Project Rover, had about run out of money under the current budget when the surplus equipment turned up on the West Coast.

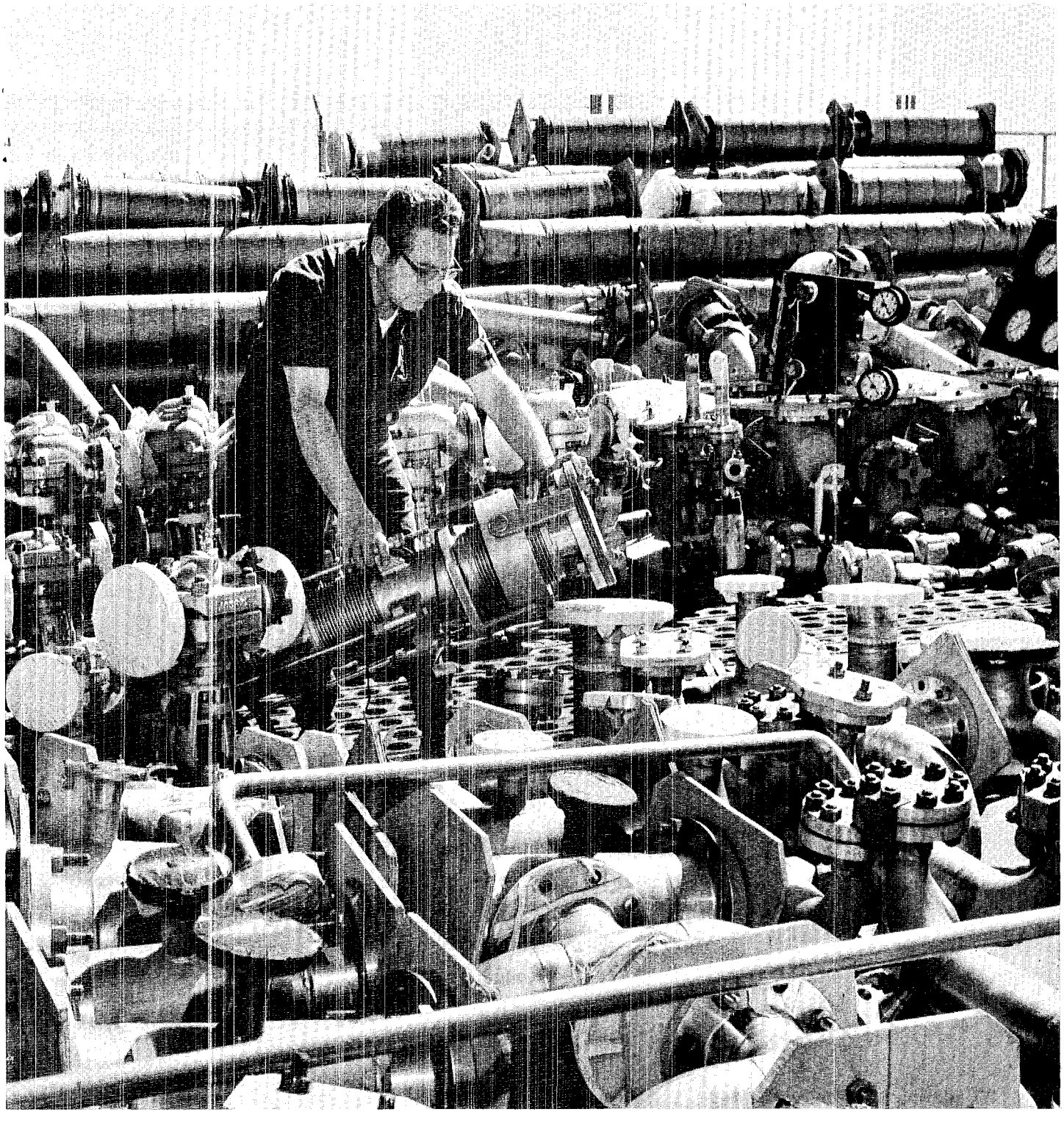
New cryogenic equipment had been planned for the test cell, so the half million in savings will be passed on to modifications which had been cut out because of the lack of money.

The Space Nuclear Propulsion Office learned that the apparatus was surplus in storage at Norton AFB, San Bernardino, California, and was available to any government agency. A team of scientists from NRDS, including Don C. Tait of LASL's J-5, inspected the equipment and found that it had higher specifications than that used for handling liquid hydrogen at minus 428 degrees Fahrenheit in Project Rover. The equipment had been used for handling liquid oxygen at U.S. Air Force Thor missile bases in Great Britain. It was returned to the United States as surplus following an agreement between England and the U.S. to dismantle and remove the bases.

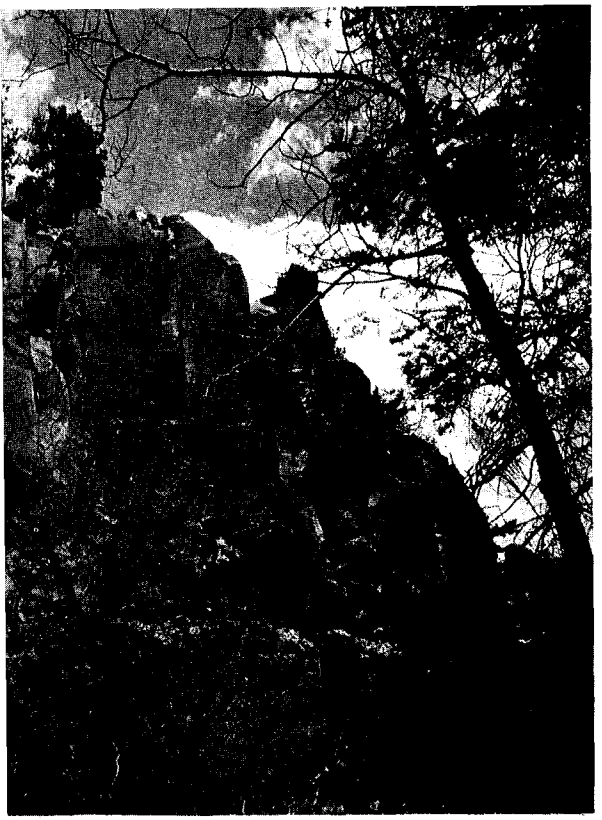
The large bolt on the left is alone worth about $50. These specially treated bolts are part of a half million dollars worth of surplus cryogenic apparatus which will be used in the Test Cell "C" modification-expansion program.

The scientists found the equipment so valuable to the Rover program that nearly $3 million worth was transferred to NRDS at no cost to SNPO except transportation charges. The equipment, except the $500,000 worth transferred to Test Cell "C," is in storage near the NRDS control point and will be used in future test cell and cryogenic work.

Jack W. Barger, LASL's assistant Test Cell "C" manager, said all piping, valves, flanges, couplings, gauges, etc., transferred to LASL, have already been assigned a specific part in the test cell modification. The parts are being taken to LASL's Equipment Testing Laboratory (J-7) and to J-5's Systems Quality Assurance Program laboratory, where over a period of time they will be cleaned, inspected, pressure checked, bagged, tagged for the modification program, and stored until needed.



Jack Barger, assistant Test Cell "C" manager at the Nuclear Rocket Development Station, stands amidst surplus cryogenic equipment worth about a half million dollars. The longer lengths of stainless steel pipe with flanges, stacked in the background, are worth about $2,500 each. Of the misalignment bellows he is holding here, Barger said, "We couldn't begin to afford one of these." Every piece of this equipment will be used in Test Cell "C."



New trails explore a region which has been inaccessible except for determined hikers and fishermen.

BRING ON BANDELIER

Extensive improvements in trails and camping facilities have been completed in Bandelier National Monument in anticipation of a record year for attendance which may reach 130,000, according to Superintendent Albert Henson. The total reached 100,000 for the first time in 1963.

With the completion of the new 100-unit campground on Frijoles Mesa, near the entrance station just off Highway 4, all camping has been stopped in the lower campground which now will be restricted to picnicking.

Individual camp sites in the new mesa-top area are located along three loop roads. Each site consists of a paved parking space, table and fireplace. Garbage containers and water hydrants are nearby. Modern comfort stations are located in each of the three loops. Although no trailer connections are available at any of the sites, there is a trailer sewage disposal station.

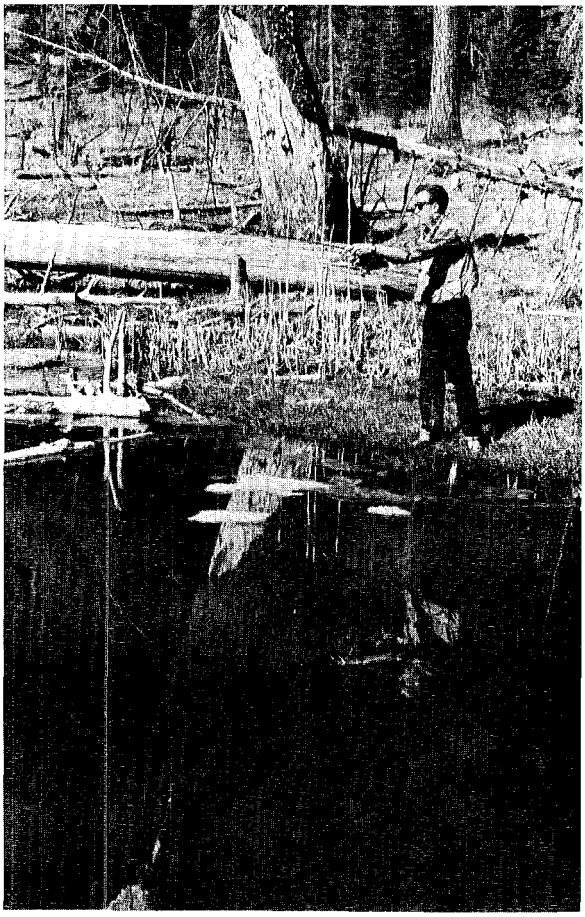
Immediately adjacent to the campground, in the old rock quarry, a new campfire circle is scheduled to be built soon and should be ready for use during the latter part of the summer.

An old Indian trail which leads from the new campground to an ancient shrine on the rim of the

The deep canyons, multi-colored cliffs and dense forests of the upper Frijoles region bordering Highway 4 are part of the corridor between Bandelier National Monument and the Valle Grande region proposed as a national park.

THE TOURISTS . . . IS READY

Many Improvements Have Been Completed At Los Alamos' Neighboring National Monument In Anticipation of a Record Number of Visitors



Beaver ponds on the Upper Frijoles are now easily accessible over a renovated trail by way of Apache Spring as the result of recent improvement work by the Park service and Bandelier National Monument.

canyon has been restored. This trail, which is approximately 1.2 miles in length, provides several spectacular views into Frijoles Canyon. (See *The Atom,* Feb., 1964).

Several other new trails have been added to the Monument's extensive trail system, perhaps the most popular being the Frijolito Ruin Trail. (Frijolito Ruin is on the south rim of the canyon immediately above the headquarters area). The trail starts at the Visitor Center and leads directly up the south side of Frijoles Canyon. Although steep, the trail has numerous resting places which provide outstanding views of the canyon and Tyuonyi Ruin. The round trip to Frijolito Ruin is 1.3 miles and should take about one hour.

Th Frijolito Ruin Trail is actually the beginning of the shortcut trail to the Shrine of the Stone Lions. This is a new trail which reduces the distance to the Shrine of the Stone Lions by three miles. Construction of this trail required making a new crossing of Alamo Canyon approximately 3.5 miles downstream from the older Alamo crossing. Although the trail was constructed mainly in order to provide quicker access into the back-country for the National Park Service's fire fighting crews, it should prove popular with the ever increasing number of visitors who enjoy hiking into the wilderness sections of the Monument.

The restoration of the long forgotten Apache Spring-Beaver Dam trail in the Upper Frijoles section of the Monument should also prove popular to hikers. It is 1.5 miles in length and provides access to the upper limits of Frijoles Canyon, several miles above Upper Crossing.

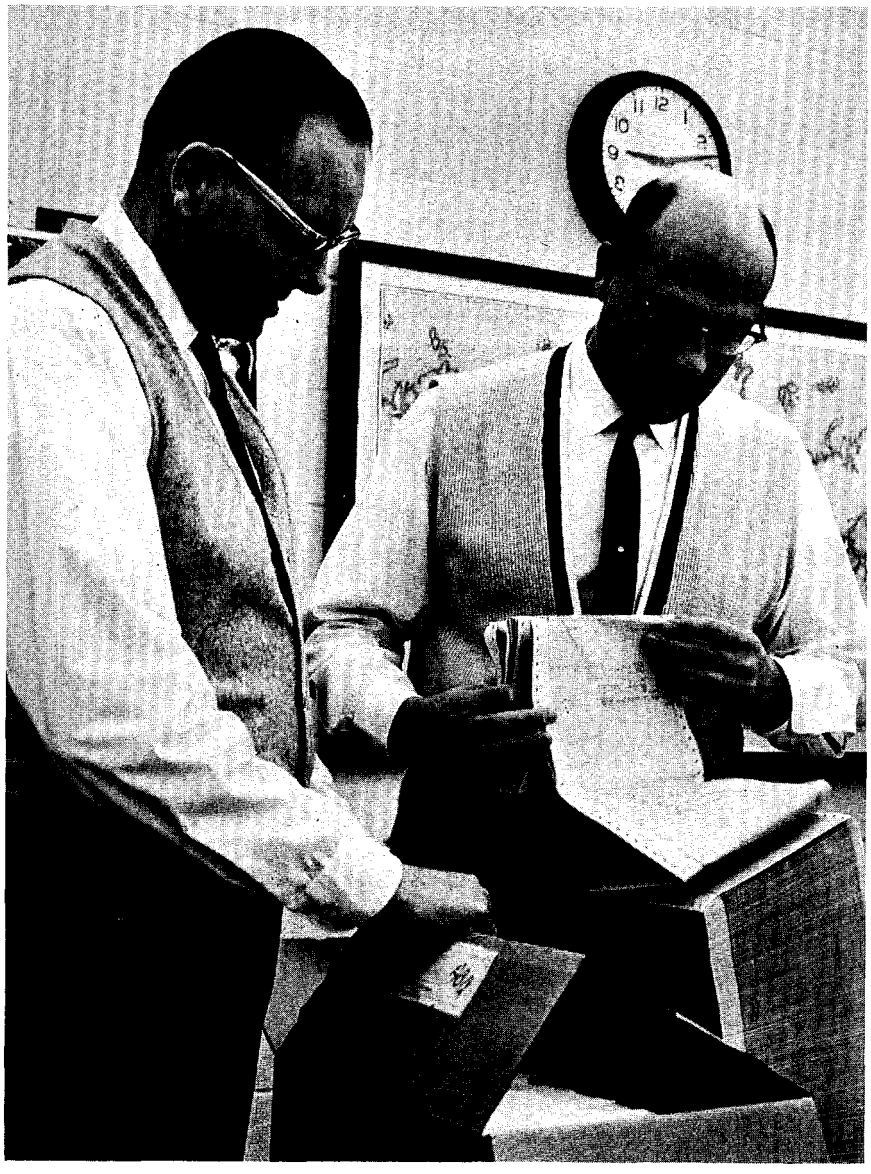
All of the other trails in the Monument have been reworked and placed in good condition in readiness for expected heavy use. Three trail shelters—at the Upper Crossing, Lower Alamo Crossing and in Capulin Canyon—have also been constructed. Although the shelters were constructed mainly for use by fire fighting crews, hikers and campers are invited and encouraged to use them.

In spite of the many improvements made at Bandelier National Monument during the past year, the parking situation in the headquarters area is still bad. Anyone who has visited Monument Headquarters during the summer months is aware of the problem, Henson said. With a constantly increasing number of visitors, the congestion has become worse and worse each year. The parking area has already been enlarged as much as existing buildings will permit. The only direction for further expansion would have been into the picnic area. This would have involved tearing out many of the fine trees which make the canyon so inviting.

The decision to remove camping from the canyon was one step toward solving the problem of congestion. The area upstream from the bridge has been converted to a lunch ground, for visitors who carry a lunch and do not require a fire. The area downstream is being expanded and used for picnics with fires.

Picnicking is encouraged in the new Frijoles Mesa campground, and additional picnic facilities are to be constructed at the old Los Alamos West Gate and in the recently-acquired Upper Frijoles section, according to Henson.

Automation Comes To The Travel



Endless strip of 500 tickets—numbered for accountability's sake—are checked in by Business Manager Ed Laymen (right) and Aide, Charles Harper.

Automation has come to the LASL Travel Office.

Airline tickets—the Laboratory uses about 500 a month for travel to points outside the Albuquerque area—are now written automatically on an ingenious new device called a "teleticketing machine."

A modified teletypewriter, the machine has no keyboard and prints from a small bank of letters, numbers and symbols. It feeds from a magazine of blank ticket forms.

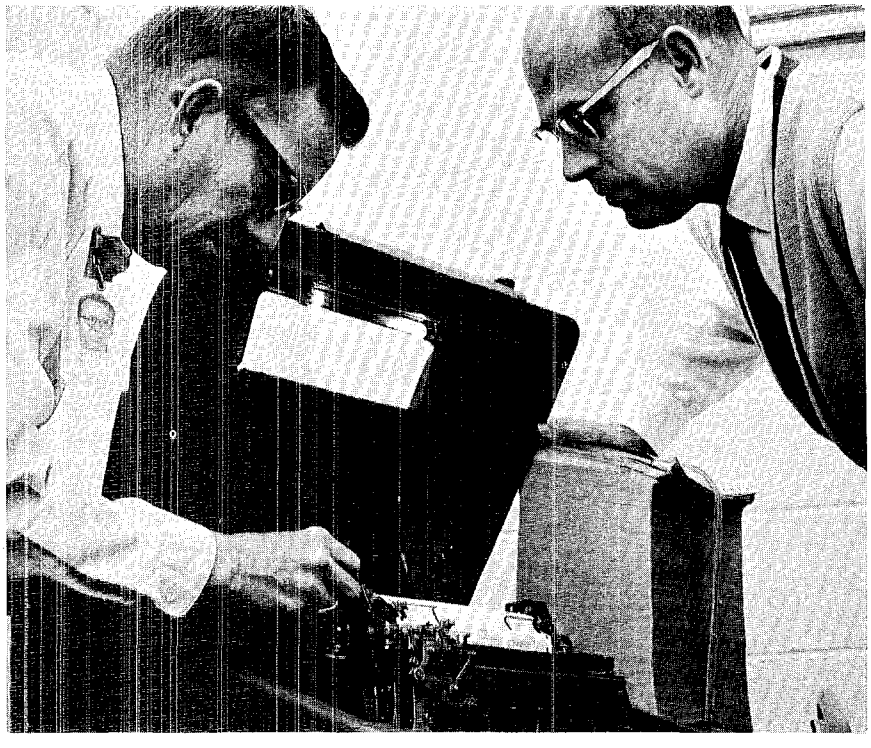
LASL Business Manager Ed Laymen said the machine lifts a burden from Travel Office clerks, who of necessity have had to write airline tickets as sort of "special agents" for the carriers in Albuquerque.

Now, when a person requests travel arrangements, the LASL clerks still figure routings but call the TWA office in Albuquerque by phone and make a reservation request. The airline's own ticket office verifies that space is available and punches a tape containing information for the ticket. The tape is fed to the teleticketing transmitter in Albuquerque and is printed out on the blank ticket in the Administration Building here.

The ticket printer is the first such installation in New Mexico. It was obtained through the cooperation of the University of California, TWA and Mountain States Telephone and Telegraph Company and operates over regular telephone lines.

Office

Travel Clerk Betty Hicks watches complete air travel ticket issue from "teleticketer." Paraphenalia used in Travel Office manual preparation of tickets is in foreground.



Final adjustment to printer is made by Willis Williams, Mountain States repairman, under eye of Ed Laymen.

Presentation at the Student Chapter of the American Nuclear Society, University of Michigan, March 18:

"Controlled Thermonuclear Experiments at the Los Alamos Scientific Laboratory" by George A. Sawyer, P-15.

Blast Simulation Conference, Sandia Base, Albuquerque, N. M., March 12:

"Explosive-Driven Shock Tube" by John W. Taylor, GMX-6.

"Sheet Explosive Loading" by Jerry Wackerle, GMX-6.

American Industrial Hygiene Association Local Section, Ottawa, Canada, March 17:

"Advanced Research Programs from the Industrial Hygiene Viewpoint" by Harry F. Schulte, H-5.

Presentation at the Anders Trial before the California Labor Compensation Board, Los Angeles, March 30-31:

"Radiation Exposure in the Vicinity of Nuclear Detonations during the Teapot Test Series (with specific reference to the case of Peter E. Anders)" by Wright H. Langham, H-4.

Chicago, Illinois Section of the Society for Nondestructive Testing, April 9:

"High Energy Radiography" by Gerold H. Tenney, GMX-1.

American Chemical Society Meeting, Philadelphia, Pa., April 5-10:

"X-ray Diffraction Evidence for Microphase Order in $CeCd_{4.3}$" by Raymond B. Roof, Jr. of CMF-5 and Guy R. B. Elliott of CMF-2.

"Kinetic Studies of Hydroxyl Radicals in Shock Waves. IV. Recombination Rates in Rich Hydrogen - Oxygen Mixtures." by Garry L. Schott and Paul F. Bird, both of GMX-7.

Explosive Cratering Meeting, Sandia Corp., Albuquerque, N.M., April 8-9.

"LASL Equation of State Calculations" by J. Paul Mutschlecner, J-15.

"LASL Hydrodynamic and Associated Codes" by J. Paul Mutschlecner, J-15.

Society for Motion Picture & Television Engineers, Los Angeles, Calif., April 12-17:

"Automatic Lens Design Illustrated by a 600-mm, F/2.0, 24°-Field Lens" by Berlyn Brixner, GMX-9.

16th Annual Conference of Southwest Foundations, The Lovelace Foundation, Albuquerque, N.M., April 10:

"Radiation Problems in Space" by Wright H. Langham, H-4.

Seminar, Arizona State College, Tempe, April 16:

"Angular Momentum Effects in Fission" by Robert B. Leachman, P-12.

The Technical Side

Astronuclear Conference, sponsored by Purdue University, Lafayette, Indiana, April 13-15.

"Types of Activities Involved in Rover and PT Work" by Raemer E. Schreiber, Dir. Off.

Seminar, University of Arizona, Tucson, April 15:

"Various Types of Fluctuations in the $C^{12}(C^{12}, \alpha)Ne^{20}$ Reaction" by Robert B. Leachman, P-12.

NEW HIRES

Shirley Marie Anderson, Gardena, California, SP-LA.

Marjorie Lorine Blackwell, Los Alamos, SD-DO.

John Allen Shively, Jamestown New York, J-7 NRDS.

Sharon Irene Farley, Espanola, N. M., SD-DO.

John K. S. Walter, Jr., Albuquerque, N.M., W-1 (Rehire).

William F. Beichler, Tucson, Arizona, SD-1.

George J. Farnham, Los Alamos, D-10 (Rehire).

Ruth Lavern Hughes, Los Alamos, PER-4 (Casual).

John Edward McCloud, Tiffin, Ohio, D-10.

Robert G. Rupprecht, Albuquerque, N.M., CMB-7.

Randall Loran Yoakum, Rolla, Missouri, J-10.

William James Blanch, Espanola, N.M., N-2 (Rehire).

Garry Eugene Tubb, Las Cruces, N.M., SP-3 (Short Term).

Johnny R. Donaldson, Monettm, Missouri, GMX-3.

Arlo James Thomas, Chicago, Illinois, P-11.

Ivan K. Kressin, Livermore, California, CMF-4 (Rehire).

Bernard H. Hansen, Chicago, Illinois, ENG-1.

William Clifton Turner, Pittsburgh, Pa., N-3.

Helen Maxine Bosier, Los Alamos, CMB-3 (Rehire).

Jimmy Fred McClary, College Station, Texas, W-4.

Gerard Sobczak, Cudahy, Wisconsin, GMX-3.

Lawrence F. Krenzien, Green Bay, Wisconsin, J-8 NTS.

Luther Dean Rickerson, Monroe, Louisiana, CMB-6.

American Ceramic Society Annual Meeting, Chicago, Illinois, April 18-23:

"Tungsten Metallizing Alumina-Yttria Ceramics" by Robert E. Cowan and Stephen D. Stoddard, both of CMB-6.

American Mathematical Society Meeting, New York City, April 20-23:

"The Pseudo-Sparseness of the Inverse Sequence of a Sparse Matrix Sequence" by William A. Beyer, T-8.

Graduate Seminar Meeting; University of Colorado, Boulder, April 21:

"Interaction of Basic Research and Applied Technology" by Louis Rosen, P-DO.

American Institute of Chemical Engineers Meeting, Engineers Club, Denver, Colorado, April 21:

"Exploring the Atomic Nucleus and the Need for a Meson Factory" by Louis Rosen, P-DO.

Fourth Rare Earth Research Conference, Phoenix, Arizona, April 22-25:

"Crystal Structures of Some Lanthanide and Actinide Iodides" by Larned B. Asprey, Thomas K. Keenan, and Ferdinand H. Kruse, all of CMF-4.

"Relativistic Self-Consistent Field Calculations for Metallic Cerium" by James T. Waber and Don T. Cromer, both of CMF-5.

"Extraction of Some Lanthanons from Aqueous Electrolytes with Lithium Amalgam" by Edward I. Onstott of CMB-8; and W. H. Smyrl and R. F. Macander, both summer students.

"The Preparation and Thermal Decomposition of the Carbonates of Tb, Dy, Ho, Er, Tm, Yb, Lu, Y and Sc" by Earl L. Head and Charles E. Holley, Jr., both of CMF-2.

"The Shape of the f-Orbital Functions" by James T. Waber, CMF-5, and John E. Hockett, CMF-13. (Not for presentation—to be published in Conference Proceedings)

DASA Conference, Rand Corp., Santa Monica, Calif., April 21-22:

"The Structure of High Altitude Fireballs" by Donald D. Eilers and Arthur N. Cox, both of J-15. (Classified meeting)

Clinic on Library Applications of Data Processing, University of Illinois, Urbana, April 26-29:

"LASL Library Data Processing Procedures for Journals" by Barbara L. Hendry, D-2.

WHAT'S DOING

All times listed
are Mountain Daylight Time

LASL EVENING LECTURE: Dr. J. Robert Oppenheimer, Director, Institute for Advanced Study, Princeton, New Jersey, "Niels Bohr and Atomic Weapons." Open to the public; no charge for admission.
Monday, May 18, 8 p.m., Civic Auditorium.

FILM SOCIETY: Civic Auditorium. Films shown 7 and 9 p.m. unless otherwise noted. Admission by $3 season ticket or 90 cents single admission.
Wednesday, May 20, "Wuthering Heights.' ' American drama, 90 minutes.
Wednesday, June 3, "Monkey in Winter," French thriller, 104 minutes.

OUTDOOR ASSOCIATION: No charge; open to the public. Contact leader for information on specific hikes.
Saturday, May 2, Rio Grande down river from Otowi Bridge.
Leader, Marlene Cockle.
Saturday, May 9, Cabezon Peak from town of Cabezon.
Leader, Herb Ungnade.
Sunday, May 24, Pedernal Peak.
Leader, Dibbon Hagar.
Tuesday, May 26, Night Hike.
Leader, Betty Hansbury.

LITTLE THEATER: "The Gazebo" at Civic Auditorium. Tickets available at the door. Season ticket holders call Doris Schonfeld, 2-4266, for reservations.
Friday and Saturday, May 22 and 23, 8:30 p.m.

INTERNATIONAL FOLK DANCE CLUB: Open to the public. Meets the first Tuesday of each month, 8 p.m., Recreation Hall.

SWIMMING CLUB OF LOS ALAMOS, INC., Membership open to adults interested in swimming. Club meets every Sunday, 7 to 9 p.m.

LOS ALAMOS HIGH SCHOOL POOL: Schedule for public swimming. Adults, 35 cents; students, 15 cents.
Saturday, 1 to 6 p.m.
Sunday, 1 to 6 p.m.
Monday, 7 to 9 p.m.
Tuesday, 7 to 9 p.m.
Wednesday, 7 to 9 p.m.

Plowshare Meeting, University of California, Davis Campus, April 21-23:

"Applications of Nuclear Explosions in Cross-Section Measurements" by Ben C. Diven, P-3.

"Applications of Nuclear Explosives to Measurements of Neutron Interactions by Foil Activation: The 'Wheel' Method" by George A. Cowan, J-11.

American Physical Society Meeting, Washington, D.C., April 27-30:

"Experiments with Polarized Protons and Their Interpretation" by Louis Rosen, P-DO. (Invited paper)

"Isomeric State in Yb^{174}" by Charles J. Orth, J-11.

"Experimentally Determined Electron Temperatures and Ion Densities for a Cesium Plasma Diode" by Walter H. Reichelt, N-5.

"Oscillator Strengths of Members of the Principal Series of Cesium" by Lewis E. Agnew, Jr., N-5 and Stephen Kahler, summer student.

"(He^3, d) Reaction on the N=28 Nuclei" by Dale D. Armstrong and Allen G. Blair, both of P-12.

"Evidence for Impurity-Host Coupling for Dilute Fe in Cu" by William A. Steyert, Jr., and R. Dean Taylor, both of CMF-9, and Darragh E. Nagle, P-11.

"Charged Particle Motion in Cusped Electromagnetic Fields" by H. Ralph Lewis, Jr. and Emory J. Stovall, Jr., both of P-14.

"The (He^3, d) Reaction on Mg^{24} and Mg^{26}" by Allen G. Blair, P-12.

"Computer Simulation of a Molecular Stopping Power Problem" by Cyril W. Hirt, T-3, and Samuel S. Blackman, formerly of T-3.

American Industrial Hygiene Association Meeting, Philadelphia, Pa., April 27-30:

"Evaluation of Particle Sizing and Aerosol Sampling Techniques" by Harry J. Ettinger of H-5, and Samuel Posner, Lovelace Foundation.

"Air Sampling and Analysis with Microcolumns of Silica Gel (Aromatic Hydrocarbons)" by Evan E. Campbell, H-5.

ON TO BALTIMORE!

LOCAL GIRL WINS TOP AWARD AT STATE SCIENCE FAIR

Seven months of hard work paid off for a Los Alamos High School girl last month when she was named one of the two top State Science Fair winners and won the honor of representing New Mexico at the National Science Fair-International, to be held this month in Baltimore.

Janice Dinegar, daughter of Rev. and Mrs. Robert Dinegar, took the honors with her project, "Quantization of Direction in a Magnetic Field—The Stern-Gerlach Experiment." The project was tops in the senior physical science class judging. Second place in this division was also won by a Los Alamos student, Kenneth Cox, whose project was a field-ion microscope. Both students are seniors and members of Mr. Leon Cooper's Advanced Physical Science course.

Sharing top honors with Miss Dinegar, was a Gallup girl, Dorothy Heck, who won first place in the senior biological science division. The two will receive all-expenses-paid trips by jet airplane to the National-International fair in Baltimore, to be held May 4-8.

Five others from Los Alamos High School were among the 400 students whose projects qualified for the state competition at Socorro. They were seniors John Landahl and Bill Zerwekh, juniors James Anderson and Charles McClenahan, and Paul Argo, a sophomore.

Los Alamos' showing was in marked contrast with that of last year when only two students entered even the regional competition and then missed the judging due to illness, in one case, and car trouble in the other. According to Mr. Cooper, any of several of this year's Los Alamos projects might have won the top award had they not been in competition with one another.

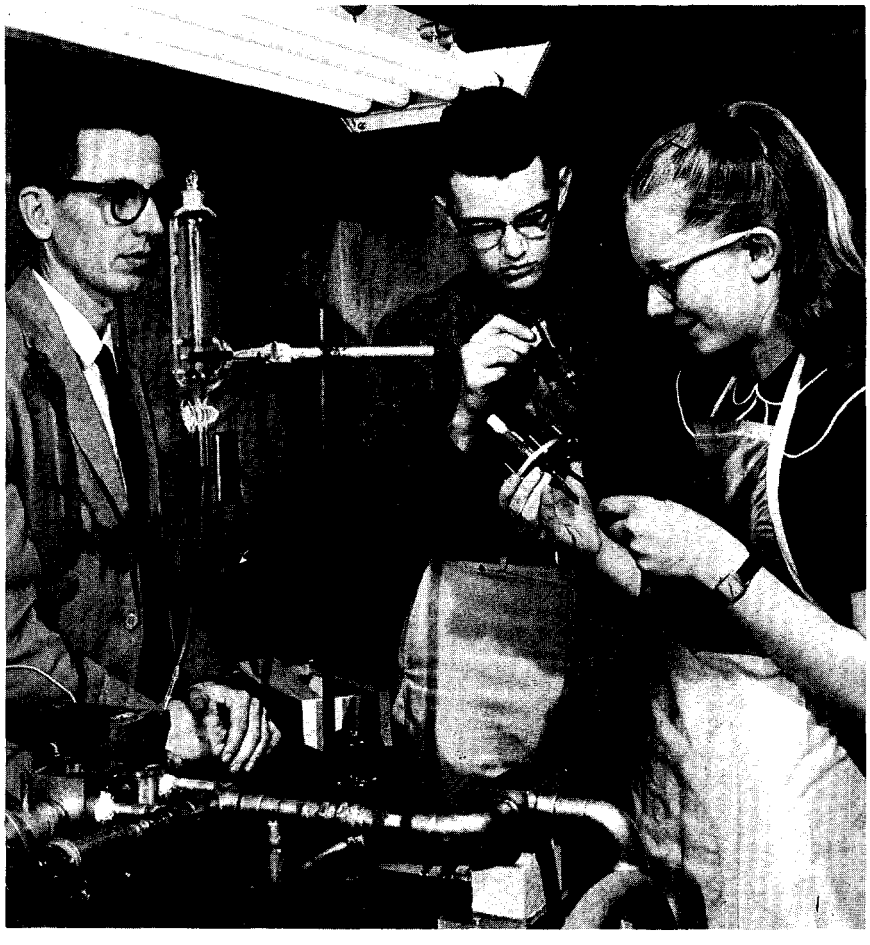
Since school began last fall, Miss Dinegar has worked on her project an average of about four hours each day. Yet she has maintained an overall grade average of better than 99 per cent, highest in her class.

She purchased most of the materials used for her experimental apparatus at the Zia Company salvage yard at a cost of less than $20. Modifications were made in the school's metal shop under her supervision.

Ironically, Miss Dinegar didn't enter her project in the local competition and it won her only a second place award in the regional fair.

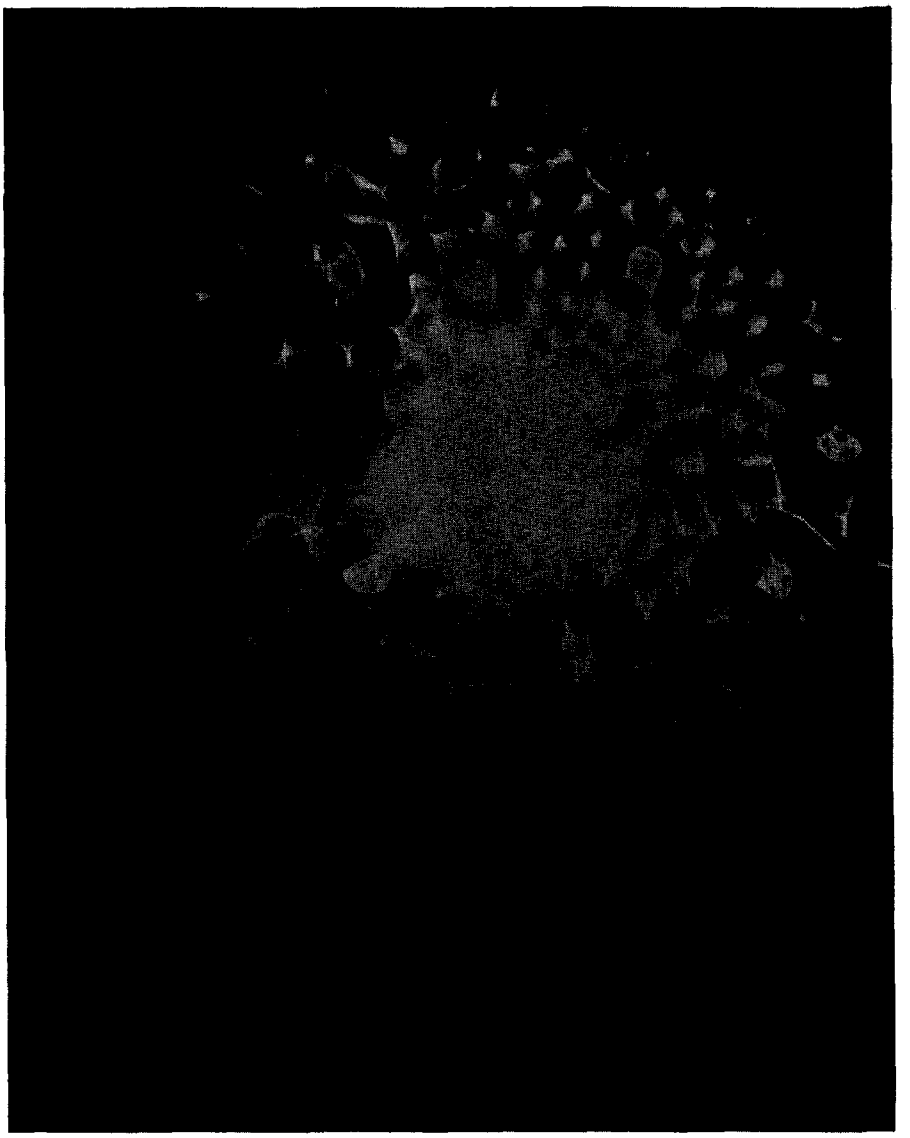
No newcomer to science competition, she entered physics projects in science fairs when she was in the seventh, eighth and ninth grades. Twice before she has gone to the state fair, once winning an honorable mention.

Next fall she will enter the University of Michigan where, not surprisingly, she plans to major in physics.



Physics teacher Leon Cooper, at left, discusses science fair projects with students Kenneth Cox and Janice Dinegar.

Its cracks filled with sealer, the exterior of this Western Area house was about to get a new paint job when this photograph was taken last month. In all probability, it will be its last coat of government paint. By the time it normally would be due for another such face-lifting by Zia Company painters, four years hence, the house will have been sold, according to the timetable for Los Alamos' disposal program. All Western Area homes are among various Los Alamos housing whose exteriors are due to be freshly painted by the end of October.



Photographic Interpretation by William Thonson

By taming the awesome energy of the hydrogen bomb in a reactor operating at stellar heat, man may produce from sea water enough power to light the world. At Los Alamos, scientists working on Project Sherwood are experimenting with several approaches to the problem of producing a controlled thermonuclear reaction.

Qualified applicants interested in Sherwood and other vital programs at Los Alamos are invited to send resumes to: Director of Personnel, Division 64-13

los alamos
scientific laboratory
OF THE UNIVERSITY OF CALIFORNIA
LOS ALAMOS, NEW MEXICO

All qualified applicants will receive consideration for employment without regard to race, creed, color or national origin. U.S. citizenship required.

Henry T. Motz
3137 Portland
Los Alamos, New Mexico